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by Jill Bohn, AFRL Public Affairs

Pictured from left to right - Staff Sgt. Benjiman D. Blythewood; Tech Sgt. James A. Cabezas; Senior Master Sgt. Patrick K. Whitley; 1st Lt. Michael A. Daniels; and Maj. William L. Melvin

WRIGHT-PATTERSON AIR FORCE BASE, Ohio — The Air Force Research Laboratory named its top officer, enlisted and reserve personnel during the 7th Annual Military Awards Banquet, Feb. 26th.

AFRL Commander Maj. Gen. Paul D. Nielsen and Chief Master Sgt. Vickie C. Mauldin presented the awards at the Wright-Patterson Club. Chief Mauldin, Command Chief Master Sergeant for Air Force Materiel Command, also served as the evening's guest speaker.

"I enjoy this event every year because it not only highlights our top performers and depth of talent around the lab, but also shows the breadth, diversity and global impact of our work," said General Nielsen. "All of the nominees represent the top-notch personnel and research that AFRL prides itself on having as a world-class laboratory."

Outstanding Airman of the Year

The award for Outstanding Airman of the Year was presented to Staff Sgt. Benjiman D. Blythewood, Space Vehicles Directorate, Hanscom Air Force Base, Mass. Blythewood was a Senior Airman when submitted for this award.

Sergeant Blythewood is a lab technician for the C/NOFS program. He helped design and construct an interleaved ion-beam gate – a crucial part of next-generation micro-satellite propulsion research.

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ML initiative produces multi-million dollar savings

by Gary Cunningham, Materials and Manufactuing Directorate

WRIGHT-PATTERSON AIR FORCE BASE, Ohio — Led by the Manufacturing Technology (ManTech) Division of the Air Force Research Laboratory's Materials and Manufacturing Directorate, the Air Force has realized a savings of more than $22 million in a year due to the Electronic Parts Obsolescence Initiative (EPOI).

According to Tony Bumbalough, ManTech project manager for EPOI, Northrop Grumman, a member of EPOI, successfully conducted the first of two pilot demonstration programs, and documented the savings by integrating a number of proactive practices and procedures, and commercially available tools that resulted in huge cost decreases in areas such as materials, redesign, production and sales.

"These savings stem from EPOI efforts to solve real world concerns such as obsolescence prediction, life cycle cost estimation and commercial off the shelf reliability prediction," Mr. Bumbalough said.

Parts obsolescence, in general, results from Diminishing Manufacturing Sources and Material Shortages (DMSMS), and has been a growing problem impacting mission readiness, costing the government millions of dollars every year.

DMSMS is prevalent in the Air Force's fielded and developmental systems where the service life or development cycle has become longer than the manufacturing life of one or more of its components.

Electronic parts obsolescence is caused by several factors. Among them has been the decrease in the average life cycle of an integrated circuit due to technological advances, while the life cycle of America's weapon systems has increased. EPOI is about predicting and proactively managing obsolescence in the most affordable manner. Understanding the impact that system design and redesign cycles have on obsolescence issues is paramount.

Yet another factor that contributes to obsolescence is a purely profit driven one. Public consumption of electronics is far greater, dwarfing the military demand. So it's much less profitable to manufacture parts that are unique to the military. @

Additional newsletter stories online at

http://www.afrl.af.mil/news/index.htm

Scientists find solvent for cleaning aircraft oxygen lines

by Timothy R. Anderl, Materials and Manufacturing Directorate

WRIGHT-PATTERSON AIR FORCE BASE, Ohio — Scientists and engineers from the Air Force Research Laboratory have teamed with the Aeronautical Systems Center (ASC) to identify a suitable, temporary replacement for Freon 113, due to it being discontinued.

Analysis conducted and recommendations made by personnel from AFRL's Materials and Manufacturing Directorate Nonmetallic Materials Division revealed that AK 225G offers equivalent cleaning to Freon 113. Freon 113 was widely used for wipe and liquid cleaning of liquid and gaseous oxygen systems in Air Force aircraft and ground service equipment before it was banned due to its ozone depleting tendencies.

According to Ed Snyder, from the directorate's Fluids and Lubricants Group, the new solvent is currently being incorporated into the Air Force Technical Order for oxygen line cleaning, which will be published by April.

The funding for the project was provided by ASC's Pollution Prevention Branch and overall leadership for the systems aspects of the program was provided by Dennis Schroll of ASC's Oxygen System Systems Program Office.

"Freon 113 (Freon TF solvent, 1, 1, 2-trichlorotrifluoroethane) was widely used by aircraft maintainers to clean equipment, including oxygen lines, which deliver liquid and gaseous oxygen within an aircraft," Mr. Snyder said. "When production of Freon 113 was discontinued, users desperately sought a robust, environmentally-friendly substitute that would perform at least as well as Freon 113."

"In many cases, maintainers found that candidate substitutes did not work as well as the previous solvent or had other characteristics that made them less than ideal," said Ms. Lois Gschwender, also from the Fluids and Lubricants Group. "In addition, it was often difficult to assess various solvents based on the manufacturers' claims. So we designed a program to identify replacement solvents for wipe and liquid cleaning of liquid and gaseous oxygen systems."

Seven solvents that were advocated as Freon 113 replacements were evaluated during testing at the directorate, the NASA White Sands Testing Facility, the Phoenix Chemical Laboratory in Chicago, Ill., and at Edwards Air Force Base, Calif. Using Freon 113 as the baseline, engineers conducted several tests to determine the solvents' ability to clean oxygen system components.

Two types of testing, liquid oxygen mechanical impact ignition resistance and autogenous ignition temperature, were concerned with the compatibility of seven candidate solvents with liquid and gaseous oxygen, which is critical to the safety of working with the solvents. Other important properties that were tested included: system materials compatibility, immersion cleaning ability, and wipe cleaning ability. Along with the properties tested, the candidate solvent needed to be environmentally friendly and possess non-toxicity at levels that were acceptable for user exposure.

The top candidates identified in the laboratory tests conducted at ML and NASA's White Sands Test Facility were tested by Ms. Joann LaRue and Ms. Amanda Schoettmer, from AFRL's Propulsion Directorate, under field conditions at Edwards Air Force Base. The validation tests consisted of using field procedures to clean contaminated oxygen system components with the candidate solvents. According to Mr. Snyder, those tests confirmed the superiority of AK 225G as the most effective of the commercially available solvents that were tested.

Since AK 225G is still an ozone depleting substance, its production is scheduled to be banned by 2020, according to existing international treaties. "However, the development of this interim solution to a very serious problem will provide additional time to develop a truly non-ozone depleting, effective, safe wipe solvent for oxygen systems, while still maintaining compliance with existing international treaties," Mr. Snyder said. @

Red carpet from page 1

He was the top graduate from Airman Leadership School and earned the John Levitow Award for leadership and scholarship.

Non-Commissioned Officer of the Year

Tech Sgt. James A Cabezas, Directed Energy Directorate, Kirtland Air Force Base, N.M., was named the Non-Commissioned Officer of the Year.

Sergeant Cabezas is the operations superintendent in the Tactical Systems Laser Branch. He served as the NCOIC of research efforts to develop next generation laser countermeasures for surface-to-air infrared missiles. He was the lead NCO on the SECAF's research efforts for the development of a combined laser package for special operations.

He is a 2003 NCO Academy distinguished graduate.

Senior Non-commissioned Officer of the Year

Senior Non-Commissioned Officer of the Year was presented to Senior Master Sgt. Patrick K. Whitley, Munitions Directorate, Eglin Air Force Base, Fla.

Sergeant Whitley is the superintendent of the Munitions Directorate. He leads over 80 military members in the safety program and associated training program.

He solved an AFRL-wide enlisted managing issue by coding the enlisted positions.

Company Grade Officer of the Year

1st Lt. Michael A. Daniels, Space Vehicles Directorate, Kirtland Air Force Base, Albuquerque N.M., was presented the award for Outstanding Company Grace Officer of the Year.

A spacecraft structures engineer, Lieutenant Daniels was picked from 144 candidates to serve on the Columbia Accident Investigation Board in May 2003.

He was the lead engineer for a $250M multi-access laser space terminal apertures project.

Reservist of the Year

Maj. William L. Melvin, Sensors Directorate, Wright-Patterson Air Force Base, was selected as the Outstanding Reservist of the Year.

A senior research engineer, he is a leader in AFRL and Air Force formulation of deployment and employment concepts for advanced technology space-based sensor systems.

Major Melvin developed a state-of-the-art adaptive radar technology concept for future air-to-ground radar systems. The technology will deliver 500 times target detection improvement over current systems. @

Missile Defense Agency opens new facility at Kirtland

by Ken Englade, Directed Energy Directorate

KIRTLAND AIR FORCE BASE, N.M. — The Missile Defense Agency, a Department of Defense organization headquartered in Washington D.C., officially opened its Kirtland facility Feb.5, taking over the renovated one-time wing headquarters building.

The 28,000-square-foot, two-story building houses 172 people: 56 military who are part of the Aeronautical Systems Center, 53 government civilian workers, and 63 contractors. All are part of the $2.1 billion Airborne Laser (ABL) program.

The Kirtland-area Missile Defense Agency opened its doors on Feb. 5. (Air Force photo by Eva Hendren)

The phased move from ABL's previous site in a Kirtland hangar on Target Road began on Oct. 20 and was completed on Nov. 7. The organization's new home was constructed in 1947 and served at various times as the headquarters for both Sandia Base and what is now the 377th Air Base Wing. It has been under renovation for almost three years.

ABL, which began as a U.S. Air Force program in 1996, transitioned from the Space and Missile Systems Center to the Aeronautical Systems Center, which oversees combat aircraft development ranging from long-range bombers to fighters, on Oct. 12, 2001. Three weeks later, on Nov. 1, 2001, management of the ABL program transitioned from the USAF to the former Ballistic Missile Defense Organization.

The Ballistic Missile Defense Organization became the Missile Defense Agency on Jan. 2, 2002, by a special order from Secretary of Defense Donald Rumsfeld. The order gave the agency management responsibility for all of the country's missile defense programs.

Under the agency's plan each service will be responsible for a different phase of missile defense. ABL, which is building the world's first combat aircraft to use a laser as a weapon, will be part of the boost-phase segment, responsible for detecting, tracking, and attacking missiles soon after launch.

ABL's first aircraft – YAL-1A – will be armed with six modules of the Chemical Oxygen Iodine Laser, a device invented at Kirtland in 1977 by what was then the Air Force Weapons Laboratory, now a part of the Air Force Research Laboratory.

Six infrared heat seekers strategically placed around YAL-1A's exterior will detect the plume of a newly launched missile. That information will be passed to a carbon dioxide laser atop the aircraft, which will zero in on the missile and provide detailed tracking information.

Once the missile has been confirmed as a potential target, two kilowatt-class lasers aboard YAL-1A will determine the aim spot on the missile and measure the amount of atmospheric disturbance. Compensated imaging technology, developed at Kirtland's Starfire Optical Range in the late 1980s, will provide data allowing ABL's battle management system to correct for atmospheric turbulence so the killer laser's megawatt-class beam can strike the missile's fuel tank, heating the metal skin until it ruptures, in effect causing the missile to kill itself.

ABL acquired what was to become YAL-1A in January 2000. The Boeing 747-400 Freighter came straight off the company's facility before it made its first flight as ABL's official aircraft.

In December 2002, it was flown to Edwards Air Force Base, Calif., pending testing and integration of the Chemical Oxygen-Iodine Laser modules and the sophisticated optical system.

To conform to the Missile Defense Agency's management plan, ABL will progress in block development fashion. Block 2004 – YAL-1A—will begin flying as a test platform with its primary goal the shootdown of ballistic missile over the Pacific Ocean. The Block 2006 aircraft, the next phase, will still be the YAL-1A plane with modifications as determined by the results of the initial tests. @

Air Vehicles Directorate opens new research facility

by Melissa Withrow, Air Vehicles Directorate

WRIGHT-PATTERSON AIR FORCE BASE, Ohio — Culminating a four year $18 million military construction project, the Air Force Research Laboratory's Air Vehicles Directorate officially opened its new Consolidated Aerospace Structures Research Facility in a ribbon cutting ceremony March 1.

This facility combines the former Air Vehicles Directorate structural dynamics and structural mechanics facilities, while adding additional capabilities; it simultaneously subjects samples to high sound pressures, elevated temperatures, and a mechanical load. No other facility in the world can duplicate its ability to create a combined environment of 2,500 degrees, 174 decibels, and 20,000 pounds of mechanical load. For comparison, steel melts at 2,500 degrees, and 174 decibels is 2,000 times louder than a rock concert.

"This facility is vital to … ensure our warfighters have the weapon systems necessary to decisively prevail against any future adversaries," said Col. Michael Leahy, Air Vehicles Directorate director, during the ribbon-cutting ceremony.

The building housing this new facility is full of history. Since its completion in 1944, most air platforms and new structural technologies have gone through its doors. It was built for full-scale aircraft static testing and sized to fit the B-36 Peacemaker, the first intercontinental bomber. The B-36, with dimensions of 162 feet long by 230 feet wide, could be turned upside down inside the building.

AFRL Commander Maj. Gen. Paul Nielsen listens to a briefing by Andy Swanson March 1 at the Air Force Research Laboratory's Air Vehicles Directorate Consolidated Aerospace Structures Research Facility Bldg. 65, Area B. (Air Force photo by Spencer P. Lane)

A few other historic aircraft tested at the building include the F-86 Saber, the Air Force's first swept wing jet fighter; the B-58 Hustler, the Air Force's first supersonic bomber; and the F-106 Delta Dart, one of the first supersonic fighters.

The new facility will support initiatives like the X-37 advanced technology flight demonstrator and the common aero vehicle.

"In this facility the dedicated professional men and women of the Air Force Research Laboratory will make advances that were inconceivable at the time of the Wright Brothers and enable the Air Vehicles Directorate to continue to give the Air Force its wings," Colonel Leahy said. "The ghosts of the aviation pioneers who went before us must be pleased to know that with your continued support, the next 100 years of flight start right here."

According to Jon Fleshman of the Army Corps of Engineers Louisville, Ky., office, the new building was completed on time and under budget. This is one of a dozen projects the Corps of Engineers has under way or recently completed at Wright-Patterson, Mr. Fleshman said. @

Information Directorate technology taken on a test drive

by Francis L. Crumb, Information Directorate

ROME, N.Y. — An Air Force Research Laboratory Information Directorate technology has been taken on a test drive by the California Department of Transportation for the purpose of displaying automated vehicle control technologies.

The program, Model-based Integration of Embedded Software (MoBIES) has 14 contractors developing embedded software design tools and three Open Experimental Platform (OEP) contractors. MoBIES is sponsored by the Defense Advanced Research Projects Agency.

The University of California at Berkeley and Caltrans conducted the demonstration, with support from the Information Directorate's Advanced Architecture and Integration Branch at Wright-Patterson Air Force Base, Ohio. It consisted of transit buses using an experimental Cooperative Adaptive Cruise Control (CACC) system to automatically maintain a platoon formation at highway speed. The demonstration was conducted on reversible commuter lanes located on a seven-mile stretch of Interstate 15 near San Diego, Calif., with the lanes closed to regular traffic during the testing and demonstrations.

"MoBIES is developing application-independent tool technologies for re-usable component-based software for complex, real-time, embedded systems," said Dale Van Cleave, program manager at the Information Directorate. "This technology is important to the Air Force because of the increasing design time, cost and risk associated with the growing complexity of embedded software for modern weapon systems,"

The demonstration hardware included two 40-foot-long compressed natural gas buses and one 60-foot diesel-fueled bus, all equipped with actuators (brake and steering) and sensors (accelerometers, gyroscope, magnetometers, radar and lidar). In addition, a wireless system was installed to allow vehicle-to-vehicle communications.

The MoBIES contribution to the demonstration was in the development of onboard embedded software which controlled the vehicles' CACC system. CACC differs from traditional cruise control systems in that the lead vehicle communicates its state information to a following vehicle, which this vehicle uses in combination with its own sensors to maintain a specified distance between itself and the lead vehicle. @

Net Index

Due to the number of submissions we receive, some sections of *news@afrl* are available exclusively on-line. The on-line version of the newsletter allows users to view the AFRL corporate calendar, news releases generated by AFRL headquarters, operating instructions, L@b L@urels and Roundups sections.

The L@b L@urels section of the electronic newsletter is dedicated to members of Air Force Research Laboratory who receive awards and honors. The Roundups section of the electronic newsletter keeps Air Force Research Laboratory employees informed about contracts AFRL has awarded. Below is an index of articles one can find in each of these on-line sections.

L@b L@urels

- **Nat'l Academy of Engineering honors VA engineer**
- **IF Directorate honors top military personnel**
- **Two ML scientists honored by Dayton area society**

Roundups

- **Rome awards $12.5M contract to Lucent Technologies**
- **Rome awards $9M contract to Veridian Engineering**

To view the full text of these and other articles visit the *news@afrl* page on the Internet at http://extra.afrl.af.mil/news/index.htm.
To submit L@b L@urels or Roundups from your directorate, send a query to AFRL Public Affairs at:

Jill.Bohn@afrl.af.mil

For more on these stories see news@afrl
http://www.afrl.af.mil/news.

ABL Director promoted to brigadier general

KIRTLAND AIR FORCE BASE, Ohio — Col. Ellen Pawlikowski, director of the Airborne Laser (ABL) program for the last four years, has been nominated for promotion to brigadier general.

Colonel Pawlikowski, who holds a doctorate in chemical engineering from the University of California at Berkeley, entered the Air Force as a second lieutenant in 1978, through the Reserve Officer Training Corps at the New Jersey Institute of Technology in Newark. Active duty was postponed until 1982, while she was working on her doctorate.

She was promoted to colonel in 1996, while working as deputy assistant to the Secretary of Defense for Counterproliferation at the Pentagon. When she was named director of the ABL program in April 2000, she was deputy director of Global Power Programs for the Assistant Secretary of the Air Force for Acquisition at Air Force headquarters in Washington. @

Space chief picked for general promotion

KIRTLAND AIR FORCE BASE, N.M. — Head of the Air Force Research Laboratory's Space Vehicles Directorate, Colonel William "Neal" McCasland, has been selected for promotion to the rank of brigadier general.

Since October 2001, Colonel McCasland has led the development and demonstration of advanced technology crucial for advancing U.S. military space superiority. Under his oversight, the directorate develops a wide range of technologies in the areas of space electronics, satellite autonomy, power, remote sensing, structures, structural control, astrodynamics, advanced distributed simulation, and aerospace environmental physics. It also designs, builds and tests experimental technology demonstration spacecraft.

Colonel McCasland received his commission in 1979, from the United States Air Force Academy, and has served in a wide variety of space research, acquisition and operations roles within the Air Force and the National Reconnaissance Office. @